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ABSTRACT

The effects of work-based learning on student achievement were examined by analyzing data from the 1996 High Schools That Work (HSTW) assessment. The comparison focused on the experiences of 12th-graders in structured work-based learning programs and 12th-graders with after-school jobs. A larger percentage of students earning school credit for work reported having higher- quality worksite learning experiences, including rotating through several jobs within a company, working frequently with a worksite mentor, and learning new technical skills in the work setting. More students in structured programs used work experiences to make the transition to a full-time job. The bad news was that students in work-based learning had lower academic achievement than those who only had jobs. The following were among the recommendations presented: (1) set high expectations and get students to meet them; (2) offer intellectually challenging vocational studies; (3) increase access to academic studies that teach high-level content; (4) require students to complete a challenging program of study; (5) integrate school-based and work-based learning; (6) engage students actively in the learning process; (7) involve students and parents in planning programs of study; (8) provide extra help; (9) ask students to share their work-based learning experiences with other students; and (10) arrange for working students to participate in seminars conducted by their academic and vocational teachers at the worksite. (MN)

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Work-Based Learning: Good News, Bad News and Hope

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Research Brief
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HIGH SCHOOLS THAT WORK

Research Brief

Number 7

SREB

Work-Based Learning: Good News, Bad News and Hope

by Gene Bottoms and Alice Presson

The 1996 *High Schools That Work* Assessment report contains positive and negative findings, as well as reason for optimism, about the performance of high school students who have after-school jobs. The assessment of reading, mathematics and science performance was given to 12th-graders completing four courses in a vocational concentration at the Southern Regional Education Board's *High Schools That Work* sites. Seventy-one percent of the students who took the assessment had part-time jobs; 44 percent of assessed students were earning school credit for their work experiences.

The SREB learned from the assessment that students in structured work-based learning programs[1] — cooperative vocational education, apprenticeships and other programs in which students receive school credit — have richer learning experiences on the job than students who work but are not enrolled in such programs. Also, students in structured work-based learning programs receive greater support from schools than students who are not in such programs. Someone at school helps students in these programs find and get the most out of a job and counsels them about further learning opportunities.

In comparing the experiences of students in structured work-based learning programs with those of students who "just had a job," the SREB found good news in two areas:

1. A larger percentage of students earning school credit reported having higher-quality work-site learning experiences, including:
   - Rotating through several jobs within a company;
   - Working frequently with a work-site mentor; *
   - Receiving instruction on how to do the work; *
   - Learning new technical skills in the work setting; *
   - Learning how to use good communication skills;
   - Having their job performance evaluated by clear standards; *
   - Being encouraged by employers daily or weekly to develop good work habits. *
2. More students in structured programs used work experiences to make the transition to a full-time job. Forty-one percent of students earning credit had jobs where they planned to work after high school, compared with only 24 percent of students who "just had a job"; 57 percent of students who earned credit had jobs that related to their vocational concentrations, compared with only 25 percent of other students who worked.

[1] Structured work-based learning is sponsored by a school and results in credit toward high school graduation. Students who "just have a job" are students who have completed three or four vocational courses and who do not receive graduation credit for workplace experiences.

* Students who received credit for their work and had these experiences had significantly higher achievement than did students not having these experiences.

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The bad news includes:

1. Students in work-based learning had lower achievement than students who just had jobs. (See Figure 1.) There are two reasons: First, students who earned credit spent more hours on the job than students who did not earn credit. Forty-eight percent of students who earned credit spent more than 20 hours per week at work, compared with only 29 percent of students who did not earn credit.

   Second, fewer students who earned credit for their work took mathematics and science courses during their senior year. Only 39 percent of students earning credit took a mathematics course as a senior, compared with 51 percent of students who did not receive credit. Only 27 percent of students earning credit took a science course as a senior, compared with 38 percent of students who did not receive credit.

2. Males who earned credit had significantly lower reading, mathematics and science achievement than males who "just had a job."

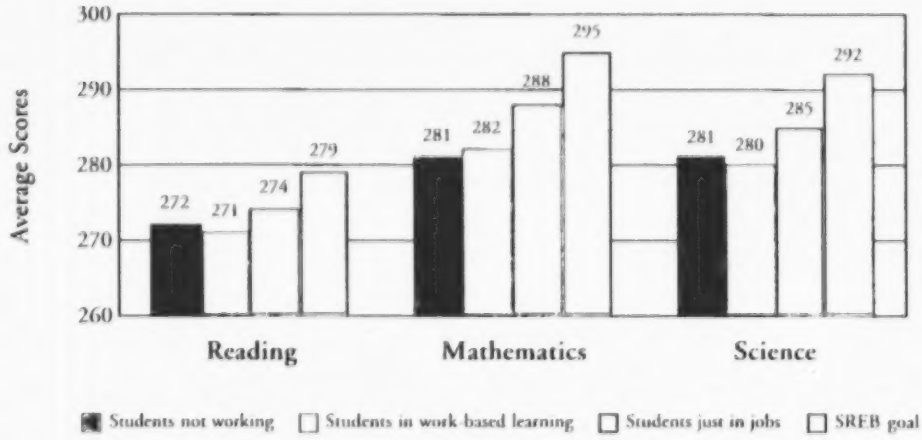
   Fewer males than females earned credit for work-site experiences — 43 percent compared with 57 percent. There was no significant difference between the reading, mathematics and science achievement of females who earned credit and females in unstructured work experiences.

3. A large percentage of students who earned credit were enrolled in business and marketing programs — 44 percent, compared with 33 percent of students who did not receive credit. Yet business and marketing students who earned credit had significantly lower achievement in reading and mathematics than students who "just had a job."

The richer learning experiences of school-sponsored, work-based learning do not offset the loss of learning that occurs when students leave school early and fail to take high-level mathematics and science courses in their senior year. Data from the 1996 *HSTW* Assessment offer little evidence that work-based learning experiences are an acceptable substitute for chemistry, Algebra II and demanding language arts courses.

Figure 1

Achievement by Students Not Working, Students Just in Jobs and Students in Work-Based Learning



Findings are from the 1996 *High Schools That Work* Assessment.

Note: Scores in each area range from 0 to 500.

Figure 2

Achievement of Students Who Earned Credit for Work by the Frequency with Which Their Vocational Teachers Gave Challenging Assignments

	Vocational teachers stressed:	
	Reading	**Mathematics**
Never	264	276
Often	275	284

Note: Scores range from 0 to 500.
Scores were statistically different.

Raising achievement of students in work-based learning programs: Actions for school leaders and local employers

School leaders — in collaboration with employers — can strengthen the performance of students in school-sponsored, work-based learning programs. These actions include:

- ***Setting high expectations and getting students to meet them***

Students who earned school credit for work experiences had significantly higher reading scores if they completed at least one hour of homework daily. Mathematics and science scores were significantly higher if students were encouraged to take more mathematics and science courses and if they took such courses as seniors.

The bad news is that nearly 40 percent of students who earned school credit for their work experiences, compared with 33 percent of students who "just had a job," were enrolled in watered-down academic and vocational courses that required no effort outside of class. Although reading achievement increased in proportion to the amount of time spent reading each week, 25 percent of students who earned school credit for their work experiences read only half an hour or less in a typical week.

It may appear that many students avoid homework and read very little because they work long hours: 48 percent work more than 20 hours per week. However, lack of time may not be the reason. Seventy percent of students who earned school credit spent two hours or more each day watching television. Are teachers allowing students to use part-time employment as an excuse for inferior performance? Teachers and employers need to send a consistent message that students are expected to do quality work and meet high standards even if they have jobs.

- ***Offering intellectually challenging vocational studies***

Students who earned school credit for work had significantly higher scores if their vocational teachers often gave challenging assignments that called for knowledge and skills in communication, mathematics and science. (See Figure 2.) Among students who earned school credit, those whose vocational teachers required them to read technical manuals, apply mathematics and use a computer frequently to complete assignments had significantly higher achievement in reading

Schools don't expect enough from students who receive credit for jobs

Too few students who receive credit for after-school jobs are being challenged in their classes. The 1996 *High Schools That Work* Assessment revealed that:

- Fifty-four percent rarely were required to use communication skills — such as researching technical information and organizing it into work-site plans — to complete vocational assignments;
- Forty-four percent rarely were required to apply mathematics to complete vocational assignments;
- Sixty-eight percent rarely had to apply science to complete vocational assignments;
- Thirty-four percent seldom or never had to use a computer to complete a vocational assignment;
- Fifty-eight percent rarely had to make a presentation in class.

and mathematics than students whose vocational teachers did not require these activities.

The bad news is that half of the students who received school credit were enrolled in vocational courses that lacked challenging assignments and projects. Vocational teachers need to raise standards in preparing youths for success in an information-centered workplace. One approach is to use industry standards to develop vocational curricula and to design challenging, school-based projects that support the teaching of complex academic and technical content.

○ *Increasing access to academic studies that teach high-level content*

Students in work-based learning programs who completed high-level English, mathematics and science courses had significantly higher average scores in reading, mathematics and science than students in similar programs who took lower-level courses. (See Figure 3.) However, none of these students met the *HSTW* goals. By comparison, students who took high-level courses and "just had jobs" met or exceeded the *HSTW* goals.

High schools must expect students who work outside of school — whether or not in a structured learning environment — to complete academic courses that develop skills in:

- Analyzing situations;
- Organizing and synthesizing written information;
- Communicating clearly;
- Measuring accurately;
- Understanding and using concepts in geometry, statistics, algebra, biology, chemistry and physical science;
- Conducting inquiries and solving real problems using mathematics and science.

○ *Requiring students to complete a challenging program of study*

High Schools That Work recommends a program of study consisting of:

- An upgraded academic core that includes four units of college preparatory English and at least three units each of mathematics and science, including at least two units in each area

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equivalent in content to courses offered in the college preparatory curriculum.

- A major that includes at least four units in a broad technical field or in further academic studies.

Students who earned school credit for work and completed two of the three academic parts of the *HSTW*-recommended curriculum (see above) either met or exceeded the *HSTW* goals of 279 in reading, 295 in mathematics and 292 in science. On a scale of 0 to 500, these youths scored 15 points higher in reading, 25 points higher in mathematics and 13 points higher in science than students who completed a less-demanding program of study.

The bad news is that 84 percent of students who earned credit for work experiences failed to complete all components of an upgraded academic core and a vocational concentration.

Many students earning credit for work experiences use their jobs as an excuse to leave school early. This happens when teachers, counselors, employers and parents ignore students' need to acquire knowledge and skills for postsecondary studies and the workplace. School leaders can address this problem by requiring students in school-sponsored, work-based learning programs to:

- Complete the *HSTW*-recommended academic core and an academic or a career major in a chosen field of study;
- Take at least three advanced academic core courses in the 12th grade, including a high-level mathematics or science course;
- Limit employment to 20 hours per week.

Integrating school-based and work-based learning

Students who earn credit for work are more likely to connect school experiences with work experiences. (See Figure 4.) Vocational teachers rather than academic teachers are more apt to help students make such connections.

Academic teachers cannot use work-based experiences to advance academic goals if they do not have an opportunity to learn about such experiences. To address this problem, schools often place academic teachers on advisory committees responsible for planning work-based learning programs. They also arrange for teachers to serve summer or school-year internships in local business and industry.

Figure 3

Performance of Work-Based Learning Students by Courses Taken

	Students in Work-Based Learning Programs		Students Who "Just Had a Job"	
	Percent Enrolled	Average Score	Percent Enrolled	Average Score
High-Level English	33	278	33	283
Low-Level English	67	267	67	270
High-Level Mathematics	61	291	67	296
Low-Level Mathematics	39	268	33	271
High-Level Science	37	285	40	291
Low-Level Science	63	277	60	280

Note: Scores range from 0 to 500. Reading goal: 279. Mathematics goal: 295. Science goal: 292.

Figure 4

Experiences that Connect School-Based Learning and Work-Based Learning

Work and School Connections	Percentage of Students Having Connecting Experiences: Students Receiving Credit for Work	Percentage of Students Having Connecting Experiences: Students Not Receiving Credit for Work
Found at School:		
Work is related to student's vocational courses.	57%	25%
Teachers know that student works and what he/she does at work.	51%	38%
Found at Work:		
Work detracts from student's time to do schoolwork.	13%	30%
Employer encourages student to develop good work habits.	92%	76%
Employer encourages student in academic studies.	76%	54%
Employer shows student how to use mathematics in job-related activities.	72%	52%
Employer shows student how to use reading, writing and speaking skills on the job.	82%	63%
Someone taught student how to do the work.	91%	71%
Employer helped student learn new technical skills.	84%	57%
Employer encouraged student to develop good customer relations.	89%	73%

Another approach is for academic teachers to work with vocational teachers and employers to develop learning activities that advance students' academic skills. Academic teachers can:

- Ask students to provide detailed answers to challenging questions about communication, mathematics and science concepts used on the job;
- Require students to develop portfolios that contain examples of academic knowledge and skills used at the work site;
- Require students to demonstrate their work-site learning;
- Teach problem-solving competencies needed in the workplace and further study;
- Require students to do field-based investigations and community projects linked to work-site experiences;
- Arrange for students to have adult work-site mentors and coaches.

- ***Engaging students actively in the learning process***

Students who earn school credit for their work experiences learn more when they are engaged in doing challenging school-based assignments. Students have higher achievement when they:

- Collect, evaluate, organize and present information for senior projects;
- Complete major research papers;
- Do short, reflective writing assignments;
- Complete special mathematics projects.

Half of the students who earned credit for their work experiences said their teachers did not relate content to the real world. In interviews at *HSTW* sites, most students who earned credit said it is difficult to learn challenging content if it is not connected to things they already know or recognize as valuable beyond the school.

Many students did not remember having to complete intellectually challenging assignments. For example:

- Sixty-eight percent never made a presentation in class about a special mathematics project;
- Fifty-one percent never used a computer to complete a mathematics assignment;
- Fifty-eight percent seldom presented oral reports in vocational classes;
- Thirty-nine percent never completed an assignment using mathematics as it is used in a work setting.

Teachers can motivate students to connect challenging academic content to its application in the workplace. For example:

- English teachers can require major written reports describing all aspects of an industry in which students are employed. To complete such a report, a student would interview a variety of employees, read documents about the company, write and refine draft copies, and prepare a final report that meets workplace and English standards.
- Mathematics and social studies teachers can require students to find workplace applications of major concepts studied in class and prepare a portfolio containing a written summary and examples of applications.
- Mathematics, science and vocational teachers can work together to develop projects that cause students to use science and mathematics in researching a problem in the community or the workplace and developing a solution to the problem. Students would develop an "essential question" that the project would address, work with the teacher and a work-site mentor to develop an investigative design, carry out the investigation and present findings in written and oral presentations.
- Vocational teachers can ask students to keep a portfolio of major projects and tasks completed at the work site and give a demonstration of a product or service based on work-site experiences. They also can work with employers to develop real-world standards for evaluating students' portfolios, products, services and demonstrations.

- ***Involving students and their parents in planning a high school program of study***

Sixty percent of students who earned school credit for work experiences planned to pursue further study, but only 33 percent completed an adequate academic core and only 40 percent really were equipped to continue their studies.

Many students do not receive guidance services to help them understand the requirements of postsecondary study. Thirty-two percent of students who earned credit for work experiences received no help in planning a high school program of study or simply did not have a plan. Only 23 percent met with their parents and a counselor or a teacher-adviser to plan a program of study. And only 36 percent of students who earned credit for their work experiences said their employers frequently encouraged them to excel in academics.

School leaders can work with postsecondary representatives to give students, parents and teachers a "reality check" on the strengths and weaknesses of students' preparation for postsecondary learning. A "reality check" can include a postsecondary placement exam or the testimony of former students who had to take remedial courses.

- *Providing extra help*

Nearly 60 percent of students who earned credit for work experiences reported receiving extra help in reading from their English teachers. Almost 80 percent reported receiving extra help from their mathematics teachers. The bad news is that fewer than 23 percent of students who received credit for work and scored below the basic level in reading and mathematics got extra help in these areas.

Schools need to provide tutorial services and extra help to students who lack mathematics and reading skills. All students who earn credit for work-based learning must take a mathematics or science course in their senior year and a demanding language-arts course that requires extensive reading and writing.

What else can educators and employers do to raise the achievement of high school students who work part time?

Opportunities arise every day to help students reach new levels of knowledge and skills in school and in their part-time jobs. Some additional ways to increase student achievement include:

- Having students serve as "consultants" to local employers. Groups of students can design marketing campaigns, conduct demographic studies or design printed materials for local companies.
- Asking students to share their work-based learning experiences with other students in the high school, middle school or elementary school. This approach hones students' organizational and presentation skills and makes them aware of gaps in their knowledge.
- Assigning students as part of their jobs to complete challenging long-term projects that relate to the work site and require development of new knowledge and skills. Employers can ask teachers to help design projects that students will be expected to complete in the workplace. Projects should support school-based learning, and teachers can ensure that high-quality academic skills are an integral part of them.
- Arranging for working students to participate in seminars conducted by their academic and vocational teachers at the work site. This approach provides opportunities for educators and employers to address the need for tougher classroom and workplace learning experiences.
- Encouraging students to do independent research on topics related to their jobs. Research can open students' eyes to career possibilities and the need for further education.
- Introducing students to new technology that they will be expected to know in many work environments. Employers can help the school update equipment and teaching skills.

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